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Electromagnetic physics sub-package of the Geant4 Monte Carlo toolkit is an important component of LHC experiment simulation and other Geant4 applications. In this work we present recent progress in Geant4 electromagnetic physics modeling, with an emphasis on the new refinements for the processes of multiple and single scattering, ionisation, high energy muon interactions, and gamma induced processes. These developments affect the results of ongoing analysis of LHC data, in particular, electromagnetic shower shape parameters used for analysis of H->gg and Z->ee decays.
The LHC upgrade to future 14 TeV run will bring new requirements regarding the quality of electromagnetic physics simulation: energy, particle multiplicity, and statistics will be increased. To address new requirements high energy electromagnetic models and cross sections are improved. Geant4 testing suite for electromagnetic physics is extended and new validation results will be presented. An evolution of CPU performance and developments for Geant4 multi-threading connected with Geant4 electromagnetic physics sub-packages will also be discussed.

Poster presentations / 501

External access to ALICE controls conditions data

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ALICE Controls data produced by commercial SCADA system WINCCOA is stored in ORACLE database on the private experiment network. The SCADA system allows for basic access and processing of the historical data. More advanced analysis requires tools like ROOT and needs therefore a separate access method to the archives.
The present scenario expects that detector experts create simple WINCC OA scripts, which retrieves and stores data in a form usable for further studies. This relatively simple procedure generates a lot of administrative overhead - users have to request the data, experts needed to run the script, the results have to be exported outside of the experiment network. The new mechanism profits from database replica, which is running on the CERN campus network. Access to this database is not restricted and there is no risk of generating a heavy load affecting the operation of the experiment.
The developed tools presented in this paper allow for access to this data. The users can use web-based tools to generate the requests, consisting of the data identifiers and period of time of interest. The administrators maintain full control over the data - an authorization and authentication mechanism helps to assign privileges to selected users and restrict access to certain groups of data. Advanced caching mechanism allows the user to profit from the presence of already processed data sets. This feature significantly reduces the time required for debugging as the retrieval of raw data can last tens of minutes. A highly configurable client allows for information retrieval bypassing the interactive interface. This method is for example used by ALICE Offline to extract operational conditions after a run is completed. Last but not least, the software can be easily adopted to any underlying database structure and is therefore not limited to WINCCOA.

Poster presentations / 439

Data Preservation at the CDF Experiment

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